

## WHAT IS CLAIMED IS:

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A  
1. A resilient and rugged probe, to measure a on-wafer signal, the probe comprising:

- 5 a metal probe tip;  
a resilient soft multi-layered dielectric substrate, coupled to the metal probe tip;  
a planar transmission structure, coupled to the metal probe tip and the resilient soft multi-layered dielectric substrate; and  
a fixed end, coupled to the resilient soft multi-layered dielectric substrate and the planar transmission structure.

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2. The resilient and rugged probe according to claim 1, wherein the metal probe tip is suspended without being supported by a medium.

15 3. The resilient and rugged probe according to claim 1, wherein the metal probe tip is used to probe the on-wafer signal.

4. The resilient and rugged probe according to claim 1, wherein the metal probe tip is able to rotate around an axis with a limited angle.

20 5. The resilient and rugged probe according to claim 1, wherein the metal probe tip is able to lift and dive.

6. The resilient and rugged probe according to claim 1, wherein the fixed end is used to support and hold the probe.

7. The resilient and rugged probe according to claim 1, wherein the fixed end is used as a transmission structure converter of the probe to connect the planar transmission structure to a coaxial transmission structure.

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8. A resilient and rugged probe, used to measure a signal of a substrate, comprising:

a probe tip;

a planar transmission structure, coupled to the probe tip; and

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a multi-layered dielectric material, coupled to the planar transmission structure and the probe tip, wherein the multi-layered dielectric material allows a device to be embedded therein.

9. The resilient and rugged probe according to claim 8, wherein the device includes a multi-layered microwave circuit.

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10. The resilient and rugged probe according to claim 8, wherein the device includes a vertical connector.

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11. The resilient and rugged probe according to claim 8, wherein the device includes a matching circuit device.

12. The resilient and rugged probe according to claim 8, wherein the probe tip is not supported by a medium.

13. The resilient and rugged probe according to claim 8, wherein the probe tip is used to probe the on-wafer signal.

14. The resilient and rugged probe according to claim 8, wherein the probe tip can rotate about an axis with a limited angle.

15. The resilient and rugged probe according to claim 8, wherein the probe tip is able to lift and dive.

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16. A resilient and rugged probe, used to measure an on-wafer signal, comprising:

a probe tip;

a connector, coupled to the probe tip; and

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a multi-layered dielectric material, coupled to the planar transmission structure and the probe tip, wherein the multi-layered dielectric material allows a device to be embedded therein.

17. The resilient and rugged probe according to claim 16, wherein the device includes a multi-layered microwave circuit.

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18. The resilient and rugged probe according to claim 16, wherein the device includes a vertical connector.

19. The resilient and rugged probe according to claim 16, wherein the device includes a matching circuit device.

20. The resilient and rugged probe according to claim 16, wherein the probe tip  
5 is not supported by a medium.

21. The resilient and rugged probe according to claim 16, wherein the probe tip is used to probe the signal of the substrate.

10 22. The resilient and rugged probe according to claim 16, wherein the probe tip can rotate about an axis with a limited angle.

23. The resilient and rugged probe according to claim 16, wherein the probe tip is able to lift and dive.

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